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Towards the MaSHReC Manufacturing System under Real-Time Constraints : a Contribution to the Application of Real-Time System Advances to Production Control Systems
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Abstract:
As more industries try to implement Flexible Manufacturing Systems, effective production control of these systems is needed to enable successful performance and safe operations. Many control decisions in a manufacturing system are made in real-time, due to the dynamic nature of the environment.

As computer technologies advance, research activities and applications involving real-time systems have grown remarkably since the last few years. The use of state-of-the-art real-time techniques in production planning and control is still rare. A novel application area of real-time systems, introduced in this thesis, is production control.

In this thesis, a restricted structure and design of a Manufacturing System underlying Real-Time Constraints (MaSHReC) is clearly defined. A scheduling methodology for MaSHReC, especially the aperiodic scheduling of hard and firm tasks in the presence of hard periodic tasks, is provided. Schedulability tests and simulation studies are generated to ensure the predictability of the system and to evaluate the performance of the algorithms respectively.